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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,672	11/21/2003	Alexandre Corjon	245497US41X CONT	9066
22850	7590	02/07/2006	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			HOLZEN, STEPHEN A	
			ART UNIT	PAPER NUMBER
			3644	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.		Applicant(s)	
	10/717,672		CORJON ET AL.	
	Examiner		Art Unit	
	Stephen A. Holzen		3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 3-7, 12, 13, 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8-11, 14-20 and 23-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Claims 1-30 are pending
2. Claims 3-7, 12, 13, 21 and 22 are withdrawn
3. Claims 1, 2, 8-11, 14-20, 23-30 have been examined
4. Applicant appears to unfamiliar with the new procedures for status identifies.

The applicant must label withdrawn claims as such, and if these claims are also being amended then the claims should be labeled as "withdrawn and amended". In certain and specific instances the applicant may combine status identifier. One of the instances is amending withdrawn claims.

5. While the examiner could have regarded the current response as "non-responsive" because of the above mention improper status identifiers, the examiner has waived this requirement. The applicant should understand that in the future the examiner will not wave this requirement.
6. The applicant has amended the independent claims such that the subject matter now being claimed is an aircraft, and not an "apparatus". The applicant should have amended the dependant claims to have similar preambles.

### ***Response to Arguments***

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 18, 24 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. How can an perturbation be an instability? Shouldn't the perturbation have an instability mode?

***Claim Rejections - 35 USC § 102 & 103***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 2, 8-11, 14-20, 23-30 are rejected under 35 U.S.C. 102(b) as anticipated by Yuan (3,936,013) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yuan in view of ordinary skill in the art.

The claimed invention is drawn to an aircraft having a wing and a device. The device is located in an area adjacent a wing location where eddies are formed. The device is structurally configured for generating a periodic perturbation in the air having a wavelength. This wavelength is capable of exciting an instability mode of the eddy and is capable of accelerating the destruction of a vortex (which forms behind the aircraft.)

Yaun teaches an aircraft having two fixed wings (11) on each side of the fuselage (12). As the aircraft moves through the air, the wings cause the air to move such that they form vortices behind the aircraft. Yaun then goes on to disclose a tube (21) for blowing a jet of fluid through an orifice 22. The extended tube is attached to the wing 11 and at least a portion thereof extends therein (see Figure 2). Fluid from the fluid source enters a conduit 23 and ejects from an orifice opening 22.

Yuan teaches that the location of the extended tube can be designed according to the configuration of the wing planform which would allow the vortex control system to operate most efficiently for a given configuration of the wings. (see Col. 3, lines 63+ - Col. 4, lines 3.) Yaun further teaches that the extending tube may be attached to the wing tip at a location anywhere between the leading and trailing edges (see Col. 4, lines 16-18).

It is, therefore, the examiners position that Yuan teaches that the tube can be located at almost any position that results in increased aerodynamic efficiency; and if Yuan does not specifically teach this, it would be obvious in light of the teachings of Yuan to locate the tube at almost any position that results in increased aerodynamic efficiency since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse 86 USPQ 70. Regarding Claims 2, 11: the jet device is either disclosed as being next to the inherent and necessarily aircraft flaps of Yaun or would have been obvious to locate adjacent thereto for the reasons of increasing vortex destruction efficiencies.

Yaun does not use applicant's specific claim language (i.e. wavelengths, exciting, instability mode, etc.). Absent any convincing evidence to the contrary the examiner believes that vortex destruction devices that interact with eddy flows "excite the instability mode" of the eddies and "accelerate the destruction of the resulting vortex".

The examiner believes this is the case since it is old and well known in the art (as taught by Bilanin et al, US 6,042,059) that the destruction of vortices is "enhanced by introducing time-varying disturbances" which "excite the instabilities" associated with an eddy. The goal of the excitation is to produce a time-varying motion in the position of the centroid of eddies of one or more vortex pairs at particular frequencies to start a process that leads to rapid break up of the vortices. Excitation

of the centroid is particularly effective for a destruction of a vortex wake. (see Col. 4, lines 42-51). Furthermore Jason Ortega (Ortega) discloses that it is well known in the art that active wake alleviation designs include concepts such as pulsating jets (page 1, col. 1, line 32) and the use of these jets causes an instability, which then drives the vortices to form vortex rings which reduce their intensity. Ortega cites Bristol et al (page 2, Col 2, lines 18-27) as showing that the wavelength of maximum instability is the one in which the vortex self induced rotation rate keeps the sinuous disturbance aligned in the straining field of the other vortex. The examiner concludes then that the wavelengths generated by Yaun's jets are exciting an instability mode of the eddies such that they accelerate the destruction of the trailing vortices.

In the alternative, should Yuan not necessarily teach such a step, or "structural limitation", such would be obvious to one having ordinary skill in the art (ordinary skill in the art is evidenced by both Ortega and Bilanin et al teachings) to design the jet such that it is configured for generating a wavelength capable of exciting at least one instability mode of a co-rotating eddy to accelerate the destruction of the vortex for the purpose of reducing the kinetic energy (turbulence) of a vortex.

Re – Claims 16, 17: These claims (which essentially have a similar scope as claim 1) further limits the diameters of the 1<sup>st</sup> and 2<sup>nd</sup> vortices. The diameters of the vortices do not limit the scope of an aircraft having a device configured to generate a

perturbation. The diameters of the vortices are dependant upon the (1) structure and size of the wings (2) the weight of the aircraft (3) the atmospheric conditions. The diameter of the vortices which are generated as a aircraft flying through the air do not limit the scope of the aircraft. In the alternative, should the applicant convincingly argue that the diameters of the vortices do limit the structure of the wings and the aircraft the examiner asserts that it would be obvious to design the aircraft and its wings such that they are "configured" to generate 1<sup>st</sup> and 2<sup>nd</sup> vortices having "diameters with excited instability modes are greater than a predetermine proportion of a distance between the first and second control-rotating vortices" since it has been held that discovering an optimum value (length) of a result (vortex destruction) effective variable (diameter) involves only routine skill in the art. In re Boeson, 617 F. 2d 272 205 USPQ 215 (CCPA 1980).

Re – Claims 18, 24 and 27: As best understood: Yuan discloses a perturbation that is capable of corresponding to a Benard-von Karman instability.

Re – Claims 19, 25 and 29: Yuan disclose a perturbation that is capable of inducing an increase in three-dimensional elliptic instabilities.

Re – Claim 28: Yuan discloses an apparatus wherein the period perturbations are cable of inducing increases in core diameter of the co-rotating eddies.



Re – Claim 30: Yuan disclose an apparatus wherein the instability mode to be excited is capable of being determined from sizes of cores of the eddies and ratios between the sizes of the cores of the eddies and a distance between the eddies.

Re – Claims 23 and 26: Yaun discloses an apparatus wherein the jet is capable of emitting a fluid transversally to a flow around the wing and thus to a longitudinal axis of the first co-rotating eddy.

Re – Claims 20: The examiner asserts that Yaun teaches that the location the jet fluid can be emitted is known to be at “any angle”. (See Col. 4, lines 37-40.) The examiner, with the teachings of Bilanin et al in mind, asserts that the internal instability mode generated by the jet of Yaun is an internal instability mode.

Alternatively should it be determined that Yaun does not necessarily disclose an “internal instability mode”, the examiner asserts that it is known to excite the internal instability of the eddy since doing would speed up the destruction of the vortex (and the examiner uses as evidence of the level of ordinary skill in the art: Bilanin et al Col. 4, lines 40-51). Therefor it would have been obvious excite the internal instability modes since the quick destruction of the vortex allows aircraft to travel closer together, one behind the other.

***Conclusion***


13. The examiner would like the applicant to know in advance that the examiner will not be persuaded with arguments, which assert that the wavelength's characteristics limit the aircraft or its perturbation device in any patentable manner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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